Development of bending soft actuator with different braided angles

Abstract

In recent years, many researchers have been focusing on the different novel techniques in designing pneumatic soft actuator that can produce bending motion. This paper presents a novel soft actuator design; a combination of different braided angles of artificial muscle applied on a single chamber soft actuator to produce bending motion. The actuator construction is based on the theory of contraction and extension of artificial muscle. It comprises of fiber-reinforced inside silicone rubber and is capable to create one-sided bending motion. Analysis of nonlinear finite element method is conducted to predict the direction and bending angles of the actuator before a prototype of actuator is fabricated. Based on the results, the developed soft actuator can realize bending motion after standard pressure driving experiment is executed.